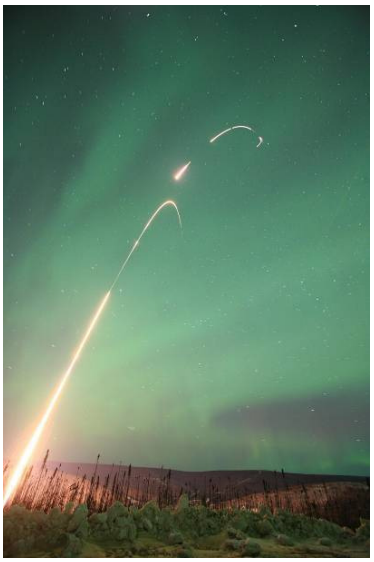
Wallops Flight Facility

Wallops Flight Facility had a particularly active and successful year in 2007. The Sounding Rocket Program conducted 17 missions, highlighted by field campaigns conducted in Poker Flat, Alaska and Norway, along with additional missions launched from Wallops and White Sands Missile Range. The figure at right shows a Poker Flat launch for observations of a pulsating aurora. See the table at the end of this article for details of the 2007 launches.



In addition to its operational missions, the Sounding Rocket Program conducted efforts to bring the Patriot and Multi-Launch Rocket System motors into the program as new low-cost configurations to support science and technology missions.

Balloon Program Office

The Balloon Program Office at Wallops Flight Facility conducted 18 missions during fiscal year 2007. Flight operations were conducted from Fort Sumner, New Mexico; Palestine, Texas; Kiruna, Sweden; and McMurdo, Antarctica. The Wallops Safety Office supported the 2007 Balloon flight program by providing flight safety risk analysis reports for operational implementation for both continental United States and foreign operations in support of Space and Earth science payloads as well as developmental test flights for new balloon design and balloon film qualification.

Flight durations ranged from 6 hours to 35 and ½ days with the longest flight occurring over Antarctica. The Balloon Program Office continued the ultra long duration balloon vehicle development. Flight testing of the ultra long duration balloon is planned for 2008. The balloon is being developed to provide extended duration flight, upwards of 60-100 days, at constant float altitudes.

See the results of the Balloon Program Missions 2007 in the table at the end of this document.

Wallops Flight Facility

Other Missions

Wallops Flight Facility was involved in a number of other programs, including measuring the changes in the Greenland ice cap, unmanned aerial vehicle demonstrations, hurricane research, and the launch of the Missile Defense Agency near field infrared satellite.

Measuring Changes in the Greenland Ice Cap

The Airborne Science Program conducted a series of missions using the Wallops Orion P-3B aircraft, including an annual campaign to measure changes in the Greenland ice cap.

Unmanned Aerial Vehicle Activities

Wallops also supported numerous unmanned aerial vehicle activities. Wallops worked with Aurora Flight Sciences to flight demonstrate a new ducted fan unmanned aerial vehicle, the GE-80, as a test platform to demonstrate advances in platform-independent science and data systems. These systems are intended to standardize systems used for science applications and streamline integration processes.

Hurricane Research

Wallops continued its hurricane research collaboration with the National Oceanic and Atmospheric Administration using the AAI/Aerosonde unmanned aerial vehicle shown at right.

Aerosonde flew in the eye wall of Hurricane Noel for 7 and ½ hours in winds reaching 80 mph at altitudes ranging from 300 to 2000 feet and provided real-time detailed observations of the near surface, high wind environment.
The Aerosonde mission into Hurricane Noel was the first ever successful flight of an unmanned aircraft into the inner core of a hurricane.

Near Field Infrared Experiment Satellite Launch

In addition to internal NASA sounding rocket and unmanned aerial vehicle missions, the Research Range conducted numerous missions for non-NASA organizations. The Range launched the near field infrared experiment satellite for the Missile Defense Agency on a Minotaur I rocket. It was the second Minotaur mission conducted by Wallops.

Wallops Flight Facility

New Range Technologies

Wallops continued development of a number of key technologies intended to improve mission capabilities and lower costs.

Low-Cost TDRSS Transceiver

The Wallops Flight Facility-developed low-cost TDRSS transceiver (LCT2) successfully added the receive capabilities to the existing transmitter capabilities. Flight tests will continue in 2008 to demonstrate the full functionality of this dramatically lower-cost system.

Autonomous Flight Safety System

The autonomous flight safety system was successfully demonstrated as a payload on the Defense Advanced Research Projects Agency-sponsored SpaceX Falcon 1 mission conducted from Kwajalein Atoll. Once fully developed and tested, this system offers the opportunity for reduced ground instrumentation by using onboard sensors and preprogrammed safety rules to determine the need for flight termination.

Phased Array Antenna

Work also began on a new phased array antenna design that offers opportunity for significantly higher data rates on suborbital and orbital launch vehicles.

Ku Band Telemetry System

Wallops is also actively developing a high data rate (~200megabytes) Ku Band telemetry system, in an effort sponsored by the Missile Defense Agency. The system will be demonstrated on a sounding rocket mission in mid-2008.

Wallops Safety Office Support

The Wallops Safety Office supported each of these missions through pre-mission analysis and certification, as well as providing operational personnel during launch operations. The Safety Office also contributed significantly to the technology efforts through providing engineering and safety expertise into designs that will enable these tools to meet range safety requirements for flight. The Safety Office also is actively engaged with other NASA and external organizations in the assessment and improvement of analysis tools that allow for streamlined and consistent implementation of safety analysis techniques for mission planning.